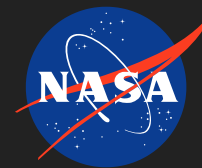


## Automated Behavior and Cohesion Assessment Tools, Phase II

Completed Technology Project (2010 - 2012)



## Project Introduction

An important consideration of long duration space flight operations is interpersonal dynamics that effect crew cohesion and performance. Flight surgeons have stated the need for unobtrusive monitoring to help detect if crews are having difficulties with coping with long duration spaceflight environments. The long-term goal of this project is to develop a set of applied technologies that can monitor crew health and cohesiveness in an unobtrusive manner and identify potential abnormalities for feedback to astronauts and flight surgeons for further investigation. The new Constellation vehicles will have thousands of procedures represented in XML, which facilitates automatic translation. Our approach is to determine nominal performance metrics during training and then compare that against data acquired during actual missions. Deviations between the nominal and current performance can be flagged for additional attention. Since crew members can perform upwards of hundreds of procedures a week, there will be substantial data with which to assess crew behavior and performance. Social interactions are also a significant factor in team cohesion and performance and we plan to establish, and then compare against, social norms using Sociometric Badges and communications (spoken and text) analysis. During Phase I research, we determined those objectives measures that are acquirable in an unobtrusive manner directly and via tractable processing and have a high likelihood of providing flight surgeons with the information they can use to best assess crew cohesion, performance, and mental state. In Phase II, we will develop and then evolve a prototype ABCAT system by iterating through a cycle of gathering test data in experiments, evaluating its effectiveness with feedback from project personnel and NASA flight surgeons, and refining or redesigning aspects of the system to improve performance.



Automated Behavior and Cohesion Assessment Tools, Phase II

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## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Responsible Program:

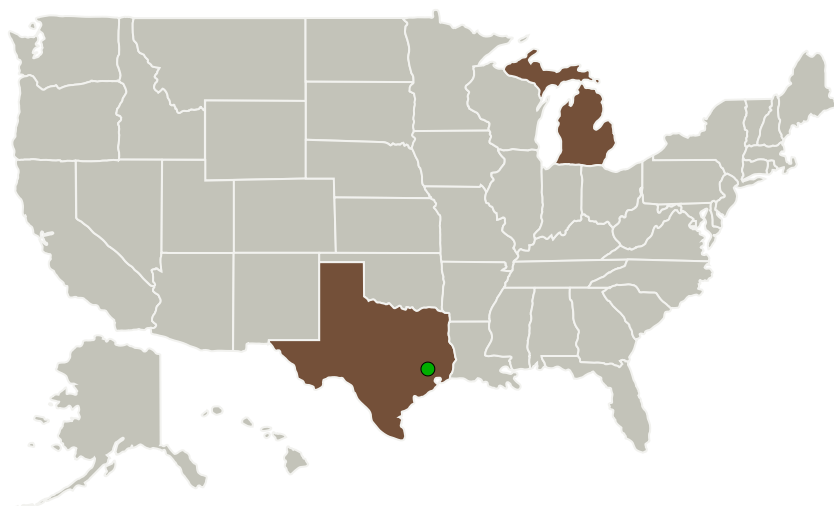
Small Business Innovation Research/Small Business Tech Transfer

## Automated Behavior and Cohesion Assessment Tools, Phase II

Completed Technology Project (2010 - 2012)



## Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
● Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas

Primary U.S. Work Locations	
Michigan	Texas

## Project Transitions

▶ **June 2010:** Project Start

✓ **June 2012:** Closed out

**Closeout Documentation:**

- Final Summary Chart(<https://techport.nasa.gov/file/138835>)

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

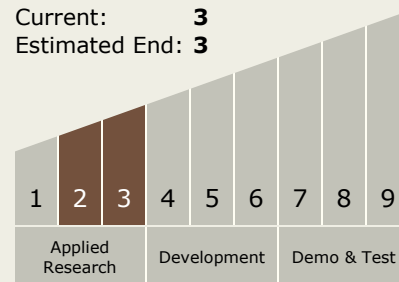
Carlos Torrez

**Principal Investigator:**

Marcus Huber

## Technology Maturity (TRL)

Start: 2  
Current: 3  
Estimated End: 3



## Technology Areas

**Primary:**

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.3 Human Health and Performance
    - TX06.3.3 Behavioral Health and Performance

## Automated Behavior and Cohesion Assessment Tools, Phase II

Completed Technology Project (2010 - 2012)



### Target Destinations

The Moon, Mars, Outside the  
Solar System, The Sun, Earth,  
Others Inside the Solar System